VS1 Series – Infrared

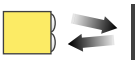
Miniature convergent/diffuse-mode self-contained sensors

VS1 Series Features

- Totally self-contained miniature sensors
- 10 to 30V dc operation
- Infrared 865 nm sensing beam
- Choose models with 10 mm (0.4") convergent point or 20 mm (0.8") diffuse
- Choose dark or light operate models
- Choose models with NPN (sinking) or PNP (sourcing) output
- 3-wire hookup; output load capacity to 50 mA
- Choice of integral cable or quick-disconnect connector

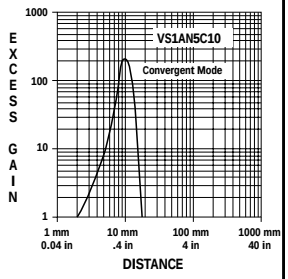
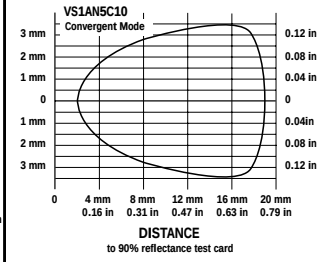
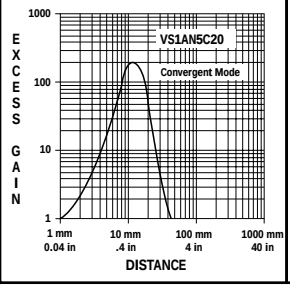
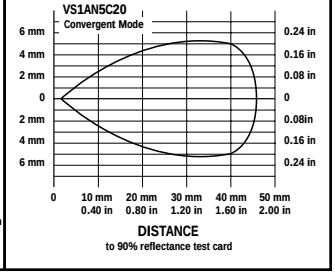
VS1 Series Overview

VS1 Series miniature self-contained sensors are designed for precision sensing in small areas previously accessible only to remote or fiber optic models. Typical applications include mounting inside vibrating feeders, punch presses, or stamping machines, where larger sensors will not fit.



Infrared, 865 nm

VS1 Series Convergent Mode Sensors

Models	Range*	Cable	Supply Voltage	Output Type	Excess Gain	Beam Pattern
VS1AN5C10	10 mm (0.4") ±5 mm	2 m (6.5') 3-wire	10-30V dc	NPN/ LO		
VS1AN5C10Q		3-Pin Pico-style Pigtail QD				
VS1RN5C10		2 m (6.5') 3-wire		NPN/ DO		
VS1RN5C10Q		3-Pin Pico-style Pigtail QD				
VS1AP5C10		2 m (6.5') 3-wire		PNP/ LO		
VS1AP5C10Q		3-Pin Pico-style Pigtail QD				
VS1RP5C10		2 m (6.5') 3-wire		PNP/ DO		
VS1RP5C10Q		3-Pin Pico-style Pigtail QD				
VS1AN5C20	20 mm (0.8") ±10 mm	2 m (6.5') 3-wire		NPN/ LO		
VS1AN5C20Q		3-Pin Pico-style Pigtail QD				
VS1RN5C20		2 m (6.5') 3-wire		NPN/ DO		
VS1RN5C20Q		3-Pin Pico-style Pigtail QD				
VS1AP5C20		2 m (6.5') 3-wire		PNP/ LO		
VS1AP5C20Q		3-Pin Pico-style Pigtail QD				
VS1RP5C20		2 m (6.5') 3-wire		PNP/ DO		
VS1RP5C20Q		3-Pin Pico-style Pigtail QD				

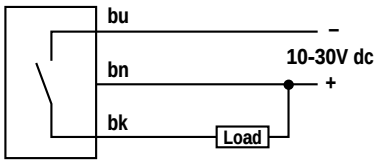
*Range based on 90% white reflectance test card

VS1 Series Specifications

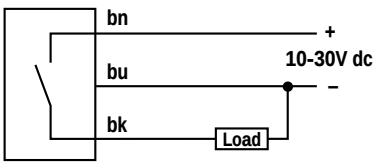
Supply Voltage and Current	10 to 30V dc (10% maximum ripple) at less than 25 mA (exclusive of load)
Supply Protection Circuitry	Protected against reverse polarity and transient voltages
Output Configuration	SPST solid-state switch Choose NPN (current sinking) or PNP (current sourcing) models Choose light operate (N.O.) or dark operate (N.C.) models
Output Rating	50 mA maximum **Off-state leakage current:** < 1 microamp at 24V dc **On-state saturation voltage:** < 0.25V at 10 mA dc; < 0.5V at 50 mA dc
Output Protection Circuitry	Protected against false pulse on power-up and continuous overload or short circuit of outputs Overload trip point ≥100 mA
Output Response Time	1 millisecond ON and OFF
Repeatability	250 microseconds
Indicators	Two LEDs: Green and Yellow GREEN **ON steadily** = power to sensor is ON GREEN **flashing** = output overload YELLOW **ON steadily** = light is sensed YELLOW **flashing** = marginal excess gain (1-1.5x) in light condition
Construction	Black ABS/polycarbonate housing with clear acrylic lens
Environmental Rating	IP67; NEMA 6
Connections	2 m (6.5') attached cable: three #28 ga stranded conductors with PE insulation; PVC outer cable jacket; or 3-pin Pico-style pigtail quick-disconnect fitting. QD cables are ordered separately.
Operating Conditions	**Temperature:** -20° to +55°C (-4° to +131°F) **Maximum Relative Humidity:** 80% at 50°C (non-condensing)
Application Notes	M2 stainless steel mounting hardware included (see "VS1 Mounting") Optional mounting

VS1 Series Sensor Hookups

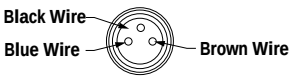
Sensors with NPN Outputs Cabled Hookup



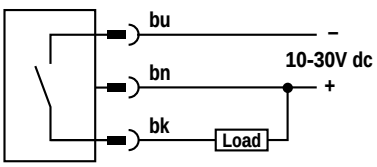
Sensors with PNP Outputs Cabled Hookup



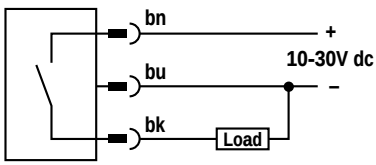
3-Pin Pico-Style Pin-out (Cable Connector Shown)



Quick-Disconnect Hookup

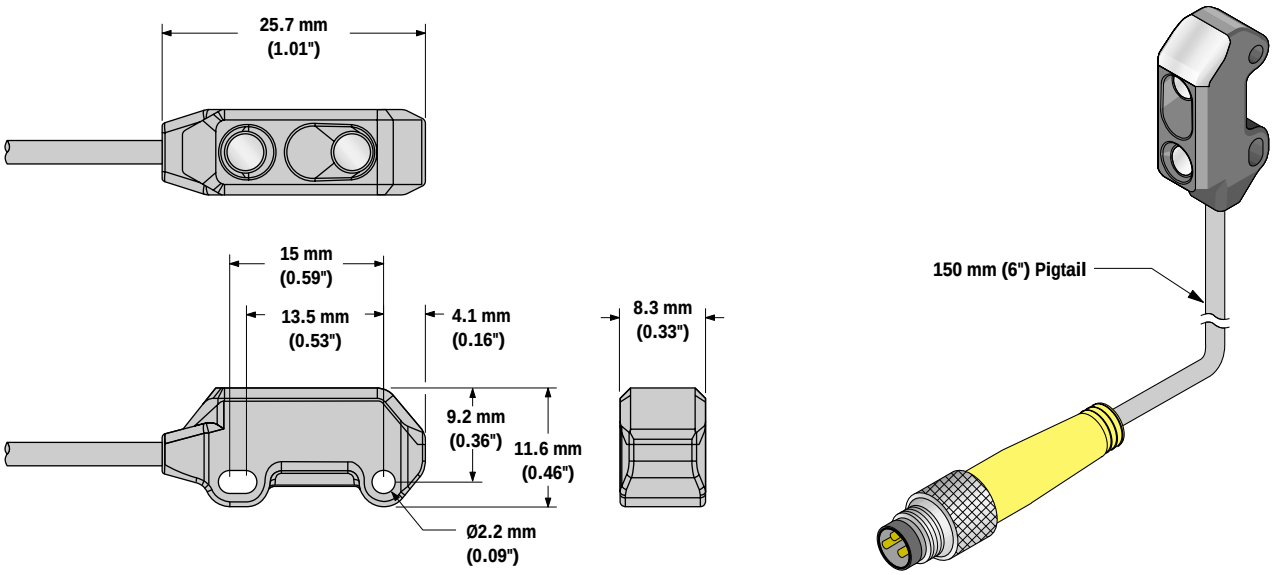


Quick-Disconnect Hookup



Banner Engineering Corp. • Minneapolis, U.S.A.
www.bannerengineering.com • Tel: 763.544.3164

VS1 Series Sensor Dimensions



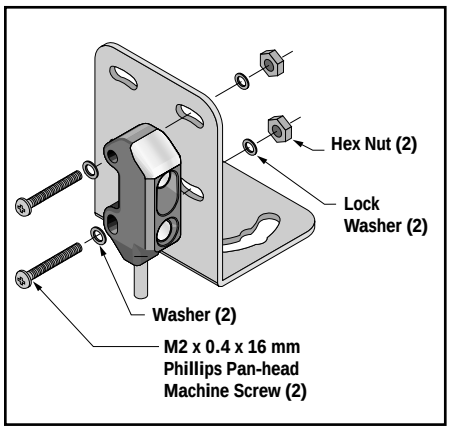


Figure 1. VS1 Series sensor mounting

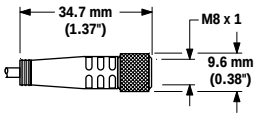
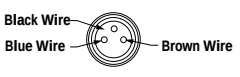
VS1 Series Mounting

Included with each sensor is a hardware packet containing two stainless steel M2 x 0.4 x 16 mm Phillips pan-head machine screws, flat washers, lock washers, and hex nuts. To mount the VS1 Series housing, use the supplied flat washer against the front surface of the sensor housing, between it and the screw head. If mounting to one of the optional brackets, place the lock washer against the back of the bracket, followed by the nut. If mounting directly to a threaded hole, place the lock washer between the screw head and the flat washer (see figure 1).

For best results, the VS1 should be mounted where it is protected from moisture, high humidity and dirt.

Accessories

Quick-Disconnect (QD) Cables

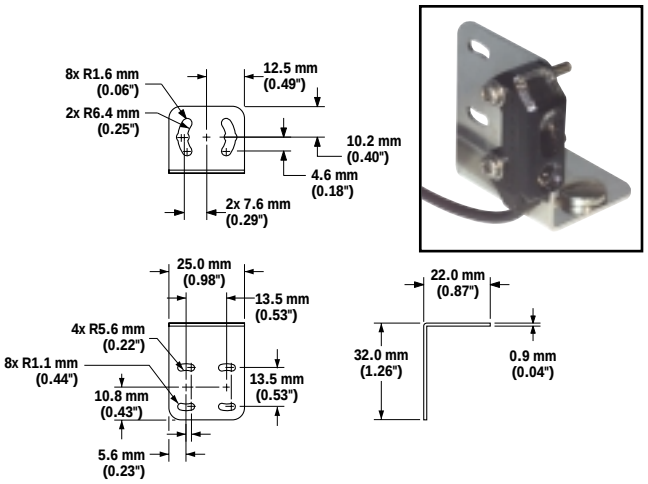
Style	Models	Length	For Use With	Dimensions	Pinout
3-pin Pico Style Straight	**PKG3M-2** **PKG3M-9**	2 m (6.5') 9 m (30')	All VS1 Series sensors with model suffix "Q".		

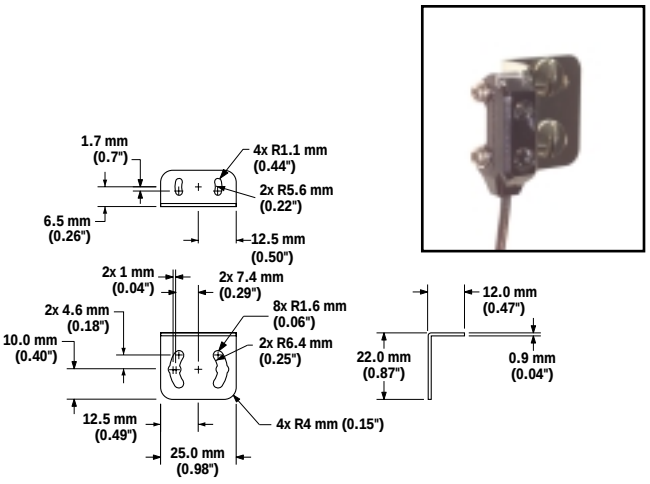
VS1 Series

Accessories

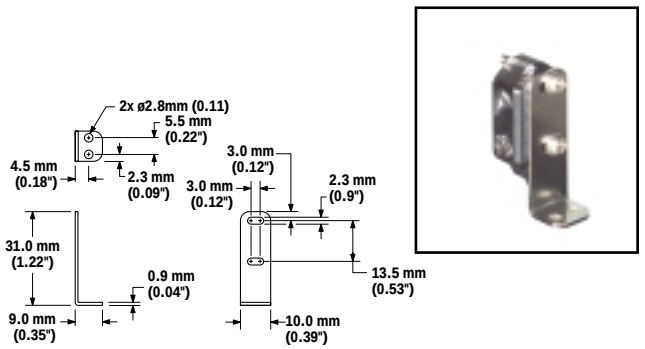
VS1 Series Mounting Brackets

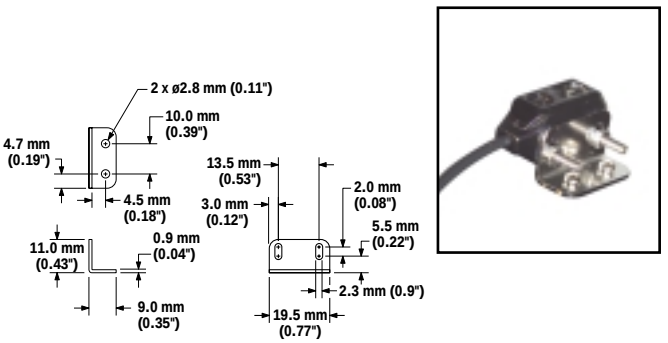
SMBVS1T	• Tall bracket • 300 series stainless steel	**SMBVS1S**	• Short bracket • 300 series stainless steel





SMBVS1TC	• Tall bracket • 300 series stainless steel	**SMBVS1SC**	• Short bracket • 300 series stainless steel





WARNING . . . Not To Be Used for Personnel Protection

Never use this product as a sensing device for personnel protection. Doing so could lead to serious injury or death.

This product does NOT include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A sensor failure or malfunction can cause either an energized or de-energized sensor output condition. Consult your current Banner Safety Products catalog for safety products which meet OSHA, ANSI and IEC standards for personnel protection.

WARRANTY: Banner Engineering Corporation warrants its products to be free from defects for one year. Banner Engineering Corporation will repair or replace, free of charge, any product of its manufacture found to be defective at the time it is returned to the factory during the warranty period. This warranty does not cover damage or liability for the improper application of Banner products. This warranty is in lieu of any other warranty either expressed or implied.